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APPLICANT: John CANNING et al.)
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TITLE: LASER ABLATION OF WAVEGUIDE STRUCTURES

THE COMMISSIONER FOR PATENTS
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AMENDED CLAIMS

1. (currently amended) A method of processing an optical device incorporating a waveguide with a core, the method comprising the step of: ~~utilizing a laser to heat and thereby ablate a surface of the device so as to induce a stress in said optical device and thereby alter an optical characteristic of the waveguide, wherein the power density of the laser is selected to effect surface ablation~~ selecting an optical characteristic of the core of the waveguide and a desired value or property of the selected optical characteristic; ~~ablating a surface of the optical device by means of a laser without ablating the core of the waveguide, the power density of the laser being selected to effect surface ablation of the optical device; and controlling the ablating of the surface so that the selected optical characteristic is modified so as to assume the desired value or property.~~
2. (original) A method as claimed in claim 1, wherein the laser comprises a carbon dioxide laser source.
3. (currently amended) A method as claimed in claim 1, wherein the

method is utilized to alter selected optical characteristics comprises the birefringent properties of the core of the waveguide.

4. (currently amended) A method as claimed in claim 3, wherein the desired property of the selected optical characteristic comprises the substantial alignment of the TM and TE birefringent modes are substantially aligned by the method.

5. (currently amended) A method as claimed in claim 1, further comprising the step of masking the surface with a thermally conductive material having an aperture defined to minimise exposure of the device to the laser.

6. (currently amended) A method as claimed in claim 1, wherein the optical device comprises a sensor.

7. (currently amended) A method as claimed in claim 1, further comprising the step of depositing a material layer on the surface.

8. (currently amended) A method as claimed in claim 7, wherein the step of depositing the material layer comprises depositing the material layer on portions of the surface affected by the ablation ablating of the surface.

9. (currently amended) A method as claimed in claim 1, further comprising the step of mounting a further component in a groove formed in the surface as a result of the ablation of the ablating of the surface.

10. (currently amended) A method as claimed in claim 7, wherein the material layer is provided as an electrode for electrically contacting the optical device.

11. (currently amended) A method as claimed in claim 9, wherein the further component comprises a modulator for modulating a characteristic of the optical device.

12. (currently amended) A method as claimed in claim 1, wherein the step of utilising the laser-to-heat ablating of the surface of said optical device is conducted at different locations of the device so as to form an optical structure.

13. (original) A method as claimed in claim 12, wherein the optical structure comprises a grating structure.

14. (currently amended) A method as claimed in claim 12, wherein the optical structure comprises a polarisation filter.
15. (currently amended) A method as claimed in claim 1, wherein the method is used to diminish UV induced changes present in the core of the waveguide.
16. (currently amended) A method as claimed in claim 1, wherein the optical device comprises an optical fibre.
17. (currently amended) A method as claimed in claim 1, wherein the method is utilised to mark the optical device by way of the ablation ablating of the surface.
18. (currently amended) A method as claimed in claim 1, wherein the laser comprises a semiconductor laser operating at a wavelength of more than about 1.8 micro metre micrometer.
19. (currently amended) A method as claimed in claim 18, wherein the surface of the optical device comprises SiO₂.
20. (currently amended) A method as claimed in claim 1, wherein the method further comprises the step of comprising providing an absorber material to facilitate the heating of the surface of the optical device.
21. (withdrawn and currently amended) An optical device incorporating a waveguide with a core, wherein the waveguide optical device has been processed utilising a laser to heat and thereby ablate a surface of the device so as to induce a stress in said device and thereby alter an optical characteristic of the waveguide, wherein the power density of the laser is selected to effect ablation by a method comprising:

selecting an optical characteristic of the core of the waveguide and a desired value or property of the selected optical characteristic;

ablating a surface of the optical device by means of a laser without ablating the core of the waveguide, the power density of the laser being selected to effect surface ablation of the optical device; and

controlling the ablating of the surface so that the selected optical characteristic is modified so as to assume the desired value or

property.

22. (new) A method as claimed in claim 1, further comprising determining a suitable ablating of the surface of the optical device by ablating the surface of the optical device or of a comparable device and determining the selected optical characteristic a plurality of times.
23. (new) A method as claimed in claim 22, including alternately ablating the surface and determining the selected optical characteristic until the selected optical characteristic has the desired value or property.
24. (new) A method as claimed in claim 22, including ablating a plurality of portions of the surface to different extents.
25. (new) A method as claimed in claim 1, wherein the ablating of the surface of the optical device introduces a compensating stress for compensating for an effect of stress on the core of the waveguide introduced during the manufacture of the optical device.